Naval Surface Warfare Center

Electromagnetic Interference Protective Backshells For Cables

US Patent # 7,811,132

Mini Market Study

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Prepared for:

NSWC-Crane Division

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Technology Synopsis

Electromagnetic Interference Protective Backshells For Cables

- This invention is a protective backshell and casing for electrical cables that protects against EMI
- EMI (electromagnetic interference) occurs when two electrical signals cross paths and one signal acts as an antenna and draws in the signal of another source causing distorted results.
- It is needed in military applications such as surveillance, radar, ships, planes and control rooms.
- It was developed independent of outside companies exclusively for the EA-18G aircraft platform

Competitors and Competitive Advantage

Competitors
Glenair
TE Connectivity
Amphenol
Bendix

- **These backshells are held to standards higher than Mil Spec 461 making them more effective at shielding EMI than any military or commercial EMI protective backshell in America.**
- Its shielding effectiveness is 95% or higher and it has been through 6 iterations of testing.
- The EMI protective backshell is effective enough to jam any signal on the planet.
- This backshell is made of aluminum instead of composites.

Potential Applications

Industry	Industry Segments	Application Segments
A. US Military (Primary Market) B. US Alliance Partners	1. Radar, Surveillance **Market Size:** 366 possible Naval aircraft	Control room equipment, Large scale video and infrared monitoring, Electronic jamming
C. Medical (Potential Application)	1. Large scale medical equipment **Market Size:** $150 Mil	Magnetic Resonance Imaging (MRI), CT Scanners, LCD's

The biggest commercial application is in expensive medical equipment. Because of its concern for the public health and safety, the Center for Devices and Radiological Health (CDRH) part of the Food and Drug Administration (FDA), has been in the vanguard of examining medical device EMI and providing solutions.[1]

1) http://www.fda.gov/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm106367.htm

Industry Insights

- TE backshells were designed before emi became a major problem. They have a brad customer base so they are apparently effective for their needs despite a lack of emi data.
- Licensing of NAVSEA technology would require a business decision beyond an engineer. Suggested contacting the local TE Sales Engineer for assistance.

- Tad Routhbauer, Senior Engineer at Glenair Inc. was contacted and showed interest in the patent but would not comment on Glenair's interest in the technology

- Tammy Belcher the Administrative Assistant to IT Directors at IU Health was contacted for information on EMI in hospitals but could not be reached for comment.

Recommendation and Next Steps

- Look into possible installations of the backshells in other military aircraft such as the 318 Boeing F/A-18E/F Super Hornets in the US Navy.
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NSWC-Crane Division

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Chief Technology Officer: Joe Gates
Inventors: Jeff Snow, Trevor Snow

Status to Date

Status	Required Tasks
Completed	Draft interview agenda/questions. Obtain mentor approval prior to interviews.
Completed	Perform in person interview with inventor(s) and/or subject matter experts (SME) in accordance with a provided checklist
Completed	Develop a short succinct (1-2 paragraphs) common language description
Completed	Perform a web search for similar / competing products.
Completed	Identify potential markets for the technology including an abbreviated horizontal and vertical analysis and potential company lists.
Completed	For the top 2-3 markets, contact potential companies to determine interest, issues, etc.

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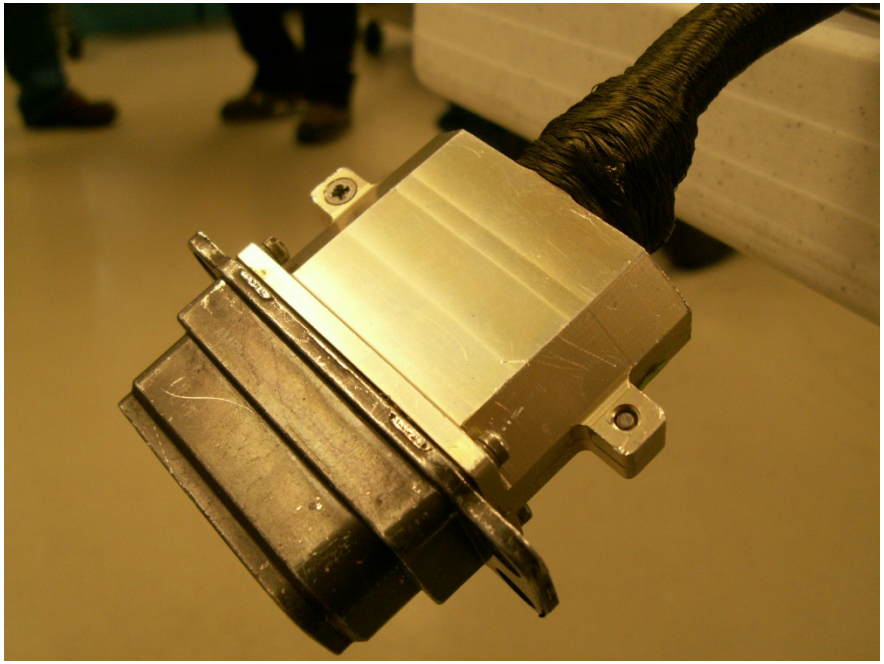
Situational Summary

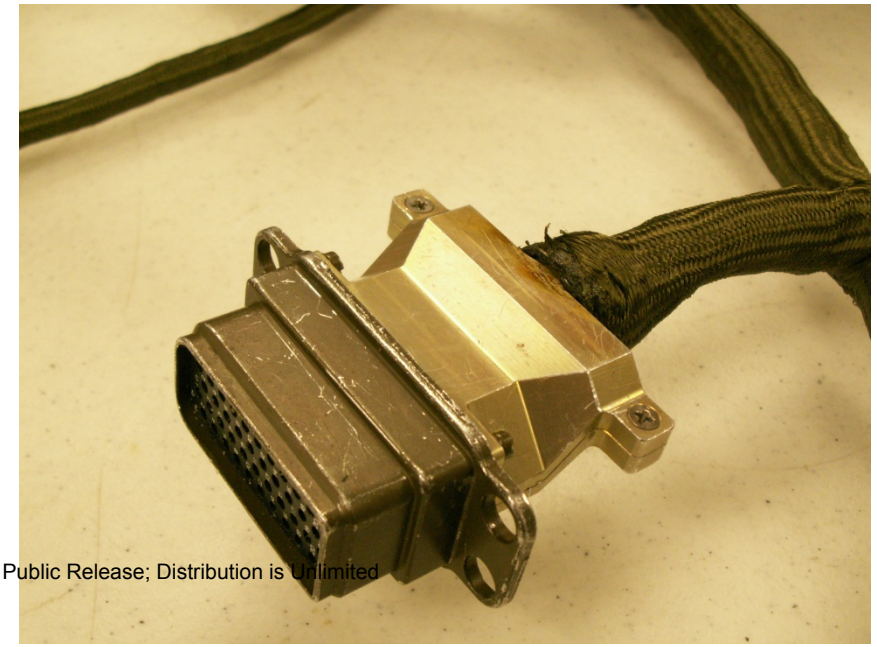
- The National Surface Warfare Center's Crane Division Technology has created an EMI protective backshell for cables.
- The technology has a small niche market and the strategy for commercialization has not yet passed military applications.
- The backshells are currently installed in the EA-18G aircraft platform.
- The need for this technology came from the inability of the highest grade EMI backshells(Mil Spec 461) to provide efficient shielding protection.
- They could possibly be fielded in similar aircraft in the future such as F18's with the inception of a newer platform similar to the EA-18G's

Market Study Goals

- Conduct on abbreviated market study assessment to:
  a. Define the technology in common language as priority, commercial and military application.
  b. Create collateral material for industry outreach.
  c. Validate collateral material communication through primary and secondary research.



Straight Assembly



Joggled Assembly

Market Opportunity

Cable Assembly Type	2007	2012	2007/2012 CAGR
Fieldbus, Insert Molded	$340	$500	8.0%
Fieldbus, Mechanical	$110	$150	6.4%
Industrial Ethernet	$180	$270	8.4%
Total	**$630**	**$920**	**7.9%**

$ Millions

- As of May 2011 48 EA-18G Aircraft had been delivered to the U.S. Navy.[1]
- The market for mechanical emi backshell assemblies was estimated at $110 million in 2007, and is expected to grow at a five-year CAGR of 6.4 percent, reaching $150 million in 2012.[2]
- The top players in the EMI protective backshells market are Glenair , Amphenol and TE Connectivity.
- Glenair manufactures up to Mil Spec 461 standards and Amphenol to SAE, AS85049 standards. Amphenol backshells are also listed in the quality products list (QPL).[3]

1) "EA-18G Growler overview" (PDF). Boeing. Retrieved 15 July 2011.
2) http://www.connectorsupplier.com/EXTRA/Articles08/extra_Colwell_IndustrialNetworks_5_13_08.htm
3) http://www.backshellworld.com/qualifications.asp

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Keys from Inventor

- Contained in the EA-18G aircraft pod
- Over $300,000 spent on R&D
- Potential high margin- $250 cost for the entire assembly
- Attempts have been made to license but no progress.

Potential Targets for Licensing

- Glenair is known for fully complying with Mil Specs and has the greatest potential to adopt this product in their line. They have been manufacturing Military backshells since the 1950's.
- Although Boeing is the maker of the aircraft, Northrup Grumman, the manufacturer of the aircraft's electronic warfare capabilities would also pose as a great potential for licensing of the backshell.